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ABSTRACT

This report uses data on 10,480 households from the Current Population Survey to investigate computer ownership and Internet use by disability status, racial and ethnic group, and age group. Analysis indicates: (1) people with disabilities are less than half as likely as their non-disabled counterparts to have access to a computer at home; (2) almost three times as many people without disabilities have the ability to connect to the Internet at home as those with disabilities; (3) people with disabilities are far less likely than those without disabilities to make use of the Internet; (4) only one-third of non-elderly persons with work disabilities have computers in their homes, compared to more than half of those without disabilities; (5) 24.9 percent of men with disabilities own computers compared to 53.2 percent without; (6) 23 percent of women with disabilities own computers versus 50.3 percent without; (7) among employed people with work disabilities, 42.6 percent have computers and 26.4 percent use the Internet, compared to 56.9 and 44 percent of their non-disabled counterparts; and (8) within each racial and ethnic group, the rate of computer ownership is much lower when there is a disability present in the household. (CR)

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REPORT 13

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Computer and Internet Use Among People with Disabilities

MARCH 2000

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Computer and Internet Use Among People with Disabilities

by

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March, 2000

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Disclaimer

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INTRODUCTION

Computer technology and the Internet have a tremendous potential to broaden the lives and increase the independence of people with disabilities. Those who have difficulty leaving their homes can now log in and order groceries, shop for appliances, research health questions, participate in online discussions, catch up with friends, or make new ones. Blind people, who used to wait months or years for the information they needed to be made available in Braille or on audiotape, can now access the very same news stories, magazine articles, government reports, and information on consumer products at the very same time it becomes available to the sighted population. People who have difficulty holding a pen or using a keyboard can use the latest speech recognition software to write letters, pay their bills, or perform work-related tasks.

These new technologies hold great promise, but as this report makes abundantly clear, the computer revolution has left the vast majority of people with disabilities behind. Only one-quarter of people with disabilities own computers, and only one-tenth ever make use of the Internet. Elderly people with disabilities, and those with low incomes or low educational attainment, are even less likely to take advantage of these new technologies. African Americans with disabilities also have an especially low rate of computer and Internet use.

Extensive media coverage was devoted to a recent analysis (National Telecommunications and Information Administration, 1999) documenting huge racial and ethnic gaps in access to electronic technologies in the United States. The present report, using data from the same survey, demonstrates that gaps in computer and Internet use based on disability status are just as large as those based on race and ethnicity.

DATA SOURCE AND METHODS

The Current Population Survey (CPS) is a nationally representative survey of approximately 50,000 U.S. households each month. Conducted by the Census Bureau for the Bureau of Labor Statistics, the basic CPS questionnaire focuses on employment status and household income. The sample consists of eight panels, with a new panel brought into rotation every month. Households in each panel are interviewed eight times—for four months in a row, and then, after an eight-month break, during the same four calendar months of the following year.

Supplementary questionnaires are often included along with the basic monthly survey. The present analysis is based on data from two such supplements: the 1998 Computer and Internet Use Supplement, conducted in December of that year, and the 1999 Annual Demographic Survey, conducted three months later, in March.

The Computer and Internet Use Supplement contained questions on household computer ownership and Internet access, as well as questions on specific uses of the Internet by each household member. It was conducted for the National Telecommunications and Information Administration (NTIA) as a means of surveying the degree of penetration of computer technology in the general population. NTIA's analysis found significant gaps in access to computers and the Internet, based on factors such as family income, race and ethnicity, and educational attainment.

Disability is not mentioned in NTIA's report, because the supplement was not designed to measure computer and Internet use among people with disabilities. No questions on disability status were asked in the supplement, nor does the basic monthly survey provide any useful way of identifying a general sample of the population with disabilities.[1]

Unlike the monthly survey, however, the March demographic supplement does include a single, broad question on work disability. Respondents are asked whether anyone in the household has "a health problem or disability which prevents them from working or which limits the kind or amount of work they can do." The question provides a reasonable way of identifying a sample of persons at least 15 years of age who are limited in their ability to work. Work disability is a narrower and more problematic definition of disability than activity limitation or functional limitation; it is also of somewhat dubious validity for people without work histories, and for those elderly people who retired from work long ago.

Because of the longitudinal nature of the CPS, it is possible to link data from the two above-mentioned supplemental surveys. Of the eight panels interviewed in December 1998, two were re-interviewed the following March.[2] Thus, for one-quarter of the sample, minus missing responses, it is possible to obtain the work disability status of those persons whose computer and Internet usage was separately measured.

The two panels for which both surveys were administered number 30,128 records, out of a total of 122,935 records for the entire Computer/Internet supplement. In 91.6 percent of these cases it is possible to merge data from the two supplements; the remaining 8.4 percent (2522 records) have been dropped for lack of work disability data. Simple non-response is one reason for missing data. Another is that the CPS is a survey of households rather than of families, and no attempt is made to recontact families who moved between interviews. The new residents of the household are interviewed instead, which leaves us with no information on the disability status of the persons of interest.

The merged sample used in this analysis numbers 27,606 records, or 22.5 percent of the full Computer/Internet Supplement sample. Some 2,196 records represent persons identified as having work disabilities. The reduced sample lacks the statistical power for a highly detailed analysis of the computer and Internet use habits of people with disabilities, but it is adequate to provide comparisons of computer ownership and Internet use among broad sub-populations with and without work disabilities.

For the purposes of evaluating computer and

[1] It would be possible, however, to use the monthly survey to analyze the population unable to work because of health, but this is an overly restrictive definition of disability.

[2] It is fortuitous that the survey was conducted in December, so that there was a partial overlap with the March demographic supplement. The previous supplement on computer and Internet use, conducted in October 1997, had no panels that overlapped with March 1997 or 1998.

Internet use among various racial and ethnic groups, this report imitates the NTIA study in using the household as the unit of analysis. The household's racial and ethnic classification is that of the first respondent listed in the survey roster—generally the person in whose name the home is owned or rented. Unlike the NTIA analysis, however, this report preserves the survey's distinction between the racial classification and the identification of Hispanic origin. In other words, a householder identifying herself as black (in response to the question about race) and of Hispanic origin (in response to a separate question on ethnicity) would have her household listed under the racial category African American as well as the ethnic category Hispanic.

For some 21.8 percent of *households*, or 10,480 of the 48,070 households interviewed in the Computer and Internet Supplement, the Demographic Supplement contains records for all household members. Only these households, for which complete work disability information is available, have been retained in this analysis.

Survey non-response has been observed to vary with age, sex, and racial background. The probability of a family changing residence during the three-month lag between interviews is also likely to vary with these characteristics. In order to reduce biases due to missing data (as well as to account for the missing panels), individual records in the merged sample have been re-weighted so as to obtain the same population estimate as the full sample in 60 age-sex-race cells (15 age bins, 2 sexes, and 2 races—black vs. other).

In the analysis of households, the re-weighting (based on the original household weight) uses the age, sex, and race of the first respondent listed in the survey roster. For this analysis, 40 age-sex-race cells are used for post-stratification, with the number of age bins reduced to 10 so that the few households headed by persons under 20 years of age are all relegated to a single age bin.

Because the estimates in this report are based on a sample of the population, they are subject to sampling error. Estimates of sampling errors have been calculated using formulas provided by the Bureau of the Census (Bureau of the Census, 1999).[3] In the data tables, estimates with low statistical reliability (standard error greater than 30 percent of the estimate) are flagged with an asterisk. All comparisons mentioned in the text have been tested for statistical significance, and, unless otherwise stated, are significant at the 95 percent confidence level or greater ($p<.05$).

[3] The stratum and primary sampling unit data necessary for direct estimation of standard errors are not provided in the CPS public use data files.

ANALYSIS RESULTS

Of the 20.9 million Americans aged 15 and over with work disabilities (see above for definition), 5.0 million have computers at home (Table A). Less than half of this group, 2.4 million people, have access to the Internet via their home computer, whether or not they choose to take advantage of it. Some 1.5 million actually use the Internet at home; 2.1 million people with disabilities make use of the Internet either at home or on some other computer.

As shown in Figure 1, people with disabilities are less than half as likely as their non-disabled counterparts to have access to a computer at home (23.9 vs. 51.7 percent). The gap in Internet access is even more striking: Almost three times as many people without disabilities have the ability to connect to the Internet at home as those with disabilities—31.1 versus 11.4 percent.

Whether through a home computer or one at work, at school, or in a library, people with disabilities are far less likely than those without disabilities to make use of the Internet. Only one-tenth (9.9 percent) of people with disabilities connect to the Internet, compared to almost four-tenths (38.1 percent) of those without disabilities. When they do use the Internet, it is likely to be done at home (7.2 percent use the Internet at home, compared to 25.9 percent of those without disabilities). Internet use away from home is much less common for those with disabilities, in part because most people with work disabilities are not employed: Only 3.9 percent of those with disabilities use the Internet outside of the home, compared to 20.6 percent of their non-disabled counterparts.

Age and Gender

Although the disability population is heavily skewed toward the older ages, and older people

Table A. Computer ownership and Internet use, by disability status and age group, ages 15 and over.

	Work disability			No disability	
	Number (1000s)	%		Number (1000s)	%
Persons aged 15 and above	20,877	100.0		189,954	100.0
Has computer in household	4,983	23.9	†	98,267	51.7
Has Internet access at home	2,379	11.4	†	59,132	31.1
Uses Internet	2,076	9.9	†	72,300	38.1
at home	1,512	7.2	†	49,126	25.9
elsewhere	821	3.9	†	39,050	20.6
Persons aged 15–64	12,579	100.0		164,928	100.0
Has computer	4,106	32.6	†	91,618	55.6
Has Internet access at home	1,991	15.8	†	55,903	33.9
Uses Internet	1,896	15.1	†	69,702	42.3
Persons aged 65 and above	8,289	100.0		23,973	100.0
Has computer	877	10.6	†	6,056	25.3
Has Internet access at home	388	4.7	†	2,944	12.3
Uses Internet	180 *	2.2	*†	2,134	8.9

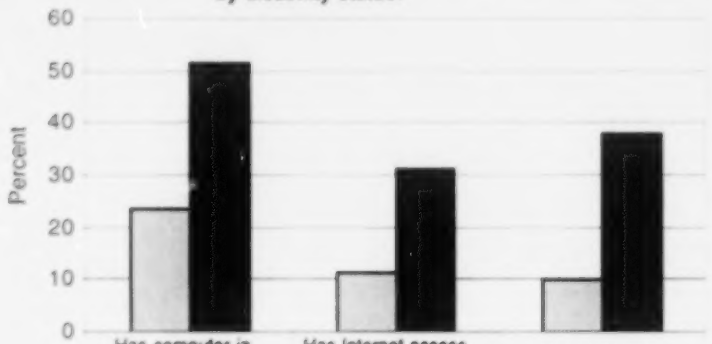
Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

†Difference in rates between populations with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

are less likely to use new technologies, the above-mentioned gaps are not accounted for by differences in age. As Figure 2 shows, significant differences remain in rates of computer ownership, Internet access, and Internet use for both the non-elderly (ages 15–64) and elderly (65 and above) populations.

Figure 1. Computer ownership and Internet use, by disability status.



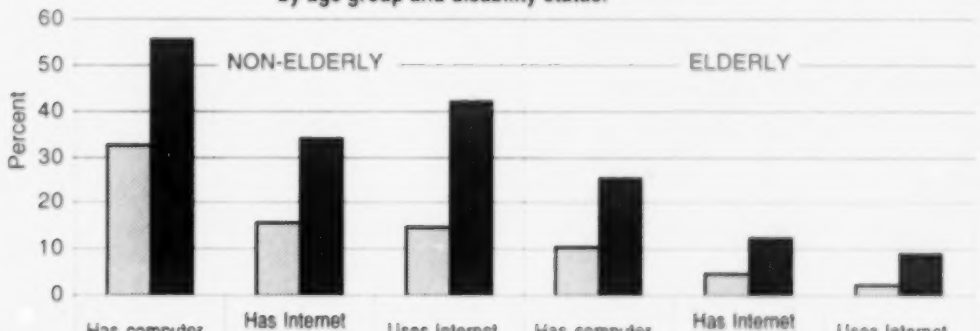
	Has computer in household	Has Internet access at home	Uses Internet
Work disability	23.9	11.4	9.9
No disability	51.7	31.1	38.1

Only one-third (32.6 percent) of non-elderly persons with work disabilities have computers in their homes, compared to more than half (55.6 percent) of those without disabilities. Once again, only about half of those computer-owners with disabilities can access the Internet—15.8 percent of the disability population, compared to 33.9 percent of the non-disabled. And the ratio of Internet use is nearly 3 to 1: 42.3 percent of people without disabilities use the Internet, compared to only 15.1 percent of those with disabilities.

Among the elderly, only one-quarter (25.3 percent) of those without disabilities have computers, but a still smaller fraction—only one-tenth, or 10.6 percent—of those with disabilities have them. Internet access is available for about half of computer owners in each group (12.3 percent of non-disabled and 4.7 percent of those with disabilities). Although actual use of the Internet is rare among the elderly, it is far higher for those without disabilities (8.9 percent) than for those with (2.2 percent).

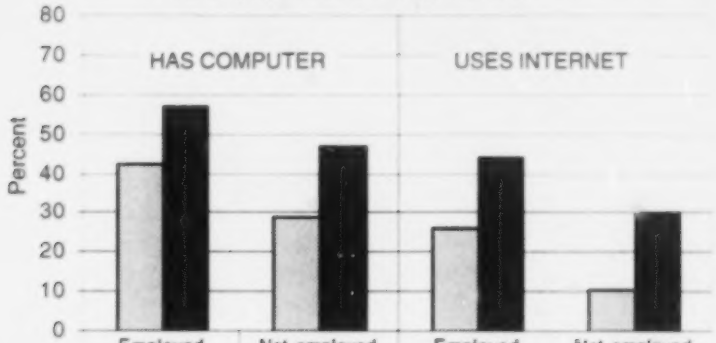
For the population as a whole, the gender gap in computer ownership and Internet use is statistically significant but surprisingly small. Just over half (51.6 percent) of men and just under half (48.7 percent) of women have access to a computer at home; one-third (33.3 percent) of men and just under a third (30.5 percent) of women use the Internet. Among the population with work disabilities, there are no statistically significant gender gaps (Table B). The gaps between those with

Figure 2. Computer ownership and Internet use, by age group and disability status.



	Has computer	Has Internet access at home	Uses Internet	Has computer	Has Internet access at home	Uses Internet
Work disability	32.6	15.8	15.1	10.6	4.7	2.2
No disability	55.6	33.9	42.3	25.3	12.3	8.9

Figure 3. Computer and Internet use, by disability and employment status, ages 18–64.



	Employed	Not employed	Employed	Not employed
Work disability	42.6	28.9	26.4	10.8
No disability	56.9	46.8	44.0	30.3

Table B. Computer ownership and Internet use, by disability status, gender, employment status, educational attainment, and family income, ages 15 and over.

	With work disability					No work disability				
	Total population	Computer in household		Uses Internet		Total population	Computer in household		Uses Internet	
	Number (1000s)	Number (1000s)	%	Number (1000s)	%	Number (1000s)	Number (1000s)	%	Number (1000s)	%
Gender										
Male	9,587	2,383	24.9 †	1,056	11.0 †	92,105	49,040	53.2	36,942	40.1
Female	11,289	2,600	23.0 †	1,020	9.0 †	97,849	49,227	50.3	35,358	36.1
Employment status (ages 18–64 only)										
Employed	3,351	1,427	42.6 †	885	26.4 †	124,001	70,547	56.9	54,621	44.0
Not employed	9,024	2,608	28.9 †	970	10.8 †	29,445	13,786	46.8	8,914	30.3
Educational attainment										
Not high school grad	7,461	949	12.7 †	179 *	2.4 *†	37,520	12,949	34.5	8,457	22.5
High school grad	11,418	3,105	27.2 †	1,294	11.3 †	108,779	53,267	49.0	35,957	33.1
College grad	1,998	929	46.5 †	604	30.2 †	43,655	32,051	73.4	27,885	63.9
Family income										
Less than $20,000	8,614	950	11.0 †	424	4.9 †	28,557	6,326	22.2	5,419	19.0
$20,000 or more	8,512	3,403	40.0 †	1,417	16.6 †	132,451	81,042	61.2	59,916	45.2

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement.

†Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

*Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

and without disabilities remain large and significant for both sexes, however. For example, 24.9 percent of men with disabilities own computers, compared to 53.2 percent without; 23.0 percent of women with disabilities own computers, versus 50.3 percent without.

Employment Status

For working-age adults, having a job can make it financially feasible to buy a computer; often, on-the-job access to computers and the Internet is also provided, along with training in how to use them. It is not surprising, therefore, that people with and without work disabilities are more likely to have computers and use the Internet if they are employed than if they are not (Figure 3 and Table B).

But even when they do have jobs, people with disabilities are significantly less likely to gain access to these new technologies: Among employed people with work disabilities, 42.6 percent have computers and 26.4 percent use the Internet, compared to 56.9 and 44.0 percent of their non-disabled counterparts. All around, rates are significantly lower among those without jobs: Only three-tenths (28.9 percent) of those with disabilities have computers, and only about one-tenth (10.8 percent) use the Internet.

Educational Attainment

People who are well educated are far more likely to have the skills, not to mention the financial resources, necessary to buy and use computer technology. But regardless of the level of educational attainment, people with disabilities have much lower rates of computer ownership and Internet use than their non-disabled peers (Figure 4).

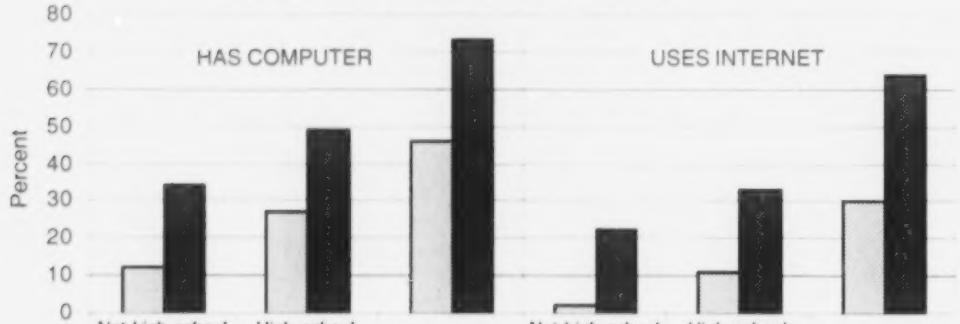
Only one-eighth (12.7 percent) of people with disabilities who have not graduated from high school own computers. This figure compares with one-third (34.5 percent) of non-high-school-graduates without disabilities, almost half (46.5 percent) of college graduates *with* disabilities, and three-quarters (73.4 percent) of college graduates without disabilities.

Even more striking is the fact that only 2.4 percent of people with disabilities who lack high school diplomas use the Internet. Those without disabilities are almost 10 times as likely to connect (22.5 percent), and those with disabilities who have college degrees are still more likely (30.2 percent). But even this last group has less than half the likelihood of Internet use as college graduates without disabilities, almost two-thirds (63.9 percent) of whom are Internet users.

Family Income

Half (50.3 percent) of people with work disabilities have family incomes of under $20,000 per year. For this group, buying a computer and paying the monthly fees of an Internet service provider may seem like a frivolous expense in relation to the basic necessities of life. Low-income

Figure 4. Computer and Internet use, by disability status and educational attainment, ages 15 and over.



	Not high school grad	High school grad	College grad	Not high school grad	High school grad	College grad
Work disability	12.7	27.2	46.5	2.4	11.3	30.2
No disability	34.5	49.0	73.4	22.5	33.1	63.9

Figure 5. Computer and Internet use, by disability status and family income, ages 15 and over.

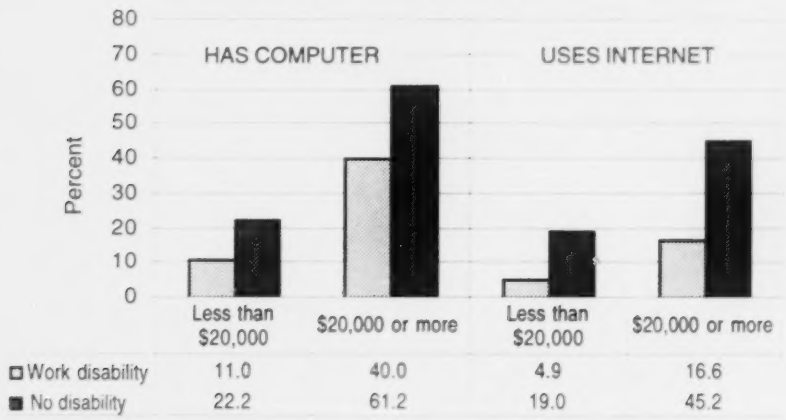


Table C. Household computer and Internet access, by race, ethnicity, and disability status of household members.

	With work disability					No work disability				
	Total households	Computer in household		Household has Internet access		Total households	Computer in household		Household has Internet access	
	Number (1000s)	Number (1000s)	%	Number (1000s)	%	Number (1000s)	Number (1000s)	%	Number (1000s)	%
All households	17,709	4,298	24.3 †	2,144	12.1 †	86,503	41,179	47.6	24,772	28.6
Race										
White	14,297	3,833	26.8 †	1,905	13.3 †	73,133	36,693	50.2	22,454	30.7
African American	2,910	311	10.7 † ¥	141	4.8 † ¥	9,879	2,602	26.3 ¥	1,130	11.4 ¥
Native American	208	43 *	20.7 *	41 *	19.5 *	583	228	39.1	143	24.6
Asian/Pacific Isl.	294	111	37.8 †	58 *	19.7 * †	2,909	1,656	56.9 ¥	1,045	35.9
Ethnicity										
Hispanic	1,257	239	19.0 †	106 *	8.5 *	6,986	2,282	32.7 ¥	1,018	14.6 ¥
Non-Hispanic	16,452	4,059	24.7 †	2,038	12.4 †	79,517	38,897	48.9	23,755	29.9

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

Note: A household is classified as having a work disability if any member has a work disability. Race and ethnicity are those of the first person listed in the survey roster, generally the person in whose name the home is owned or rented. Households of Hispanic ethnicity are also included in the appropriate racial categories.

† Difference in rates between households with and without work disability is statistically significant at the 95% confidence level or better.

¥ Rate is significantly different from that of whites (for racial groups) or non-Hispanics (for Hispanics) at the 95% confidence level or better.

* Estimate has low statistical reliability (standard error exceeds 30 percent of estimate).

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people with and without disabilities own computers and use the Internet at rates much lower than those of their more financially comfortable counterparts (Figure 5).

In both income categories, people with disabilities are significantly less likely to own computers: half as likely for the low-income group (11.0 percent vs. 22.2 percent), and two-thirds as likely for the higher-income group (40.0 vs. 61.2 percent). Use of the Internet is one-quarter as likely among the low-income group (4.9 percent for those with disabilities vs. 19.0 percent for those without) and just over one-third as likely for the higher-income group (16.6 percent vs. 45.2 percent).

Race and Ethnicity

Table C and Figure 6 present statistics on *household* computer ownership and Internet access, broken down into racial and ethnic categories (see Data Source and Methods for details on racial and ethnic classification). Households are classified as having work disabilities if one or more members of the household have a work disability.

Within each racial and ethnic group, the rate of computer ownership is much lower when there is a disability present in the household than when there is not.[4] Among white households, those with disabilities are about half as likely to own computers as are those without (26.8 vs. 50.2 percent). Among African American households, only one-tenth (10.7 percent) of those with disabilities have computers, compared to one-quarter (26.3 percent) of households having no members with disabilities. Some 37.8 percent of Asian and Pacific Islander households with disabilities have computers, compared to 56.9 percent of those without disabilities. And among Hispanic households, 19.0 percent of those with disabilities have computers, versus 32.7 percent of those with no disability.

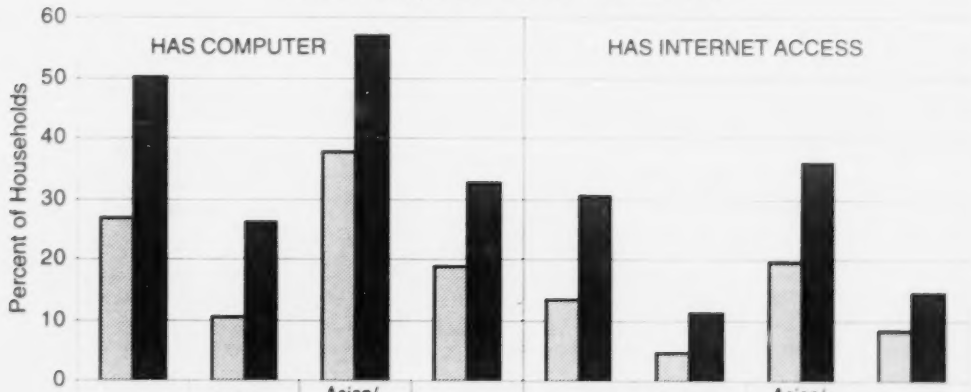
There are also large gaps in Internet access within the racial categories.[5] Across the board, households having members with work disabilities are roughly half as likely to be connected to the Internet as those without disabled members (for white households, 13.3 vs. 30.7 percent; for black households, 4.8 vs. 11.4 percent; for Asian/Pacific Islander households, 19.7 vs. 35.9 percent).

Among those households having members with work disabilities, most of the differences in rates between racial and ethnic groups are not statistically significant. But one set of differences is significant, and it bears pointing out: Among households with work disabilities, African

[4] For Native Americans, the gaps in computer ownership and Internet access are not statistically significant and have not been shown in Figure 6.

[5] Among people of Hispanic origin, the difference in Internet access rates is not statistically significant.

Figure 6. Household computer ownership and Internet access, by race/ethnicity and disability status of household members.



	White	African American	Asian/ Pacific Islander	Hispanic	White	African American	Asian/ Pacific Islander	Hispanic
Work disability	26.8	10.7	37.8	19.0	13.3	4.8	19.7	8.5
No work disability	50.2	26.3	56.9	32.7	30.7	11.4	35.9	14.6

Table D. Reasons for using the Internet, by disability status, ages 15 and over.

	Work disability		No disability	
	Number (1000s)	%	Number (1000s)	%
All Internet users	2,076	100.0	72,300	100.0
Electronic mail	1,393	67.1	54,335	75.2
Search for info.	1,304	62.8	46,466	64.3
News, weather, sports	810	39.0	32,529	45.0
Courses, schoolwork	608	29.3	25,456	35.2
Job-related tasks	543	26.2	31,182	43.1
Shop, pay bills, etc.	353	17.0	16,255	22.5
Search for jobs	330	15.9	12,066	16.7
Other	498	24.0	13,075	18.1

Source: Current Population Survey, 1998 Computer and Internet Use Supplement and 1999 Annual Demographic Supplement

American households are much less likely than white households to have a computer (10.7 vs. 26.8 percent) or have access to the Internet (4.8 vs. 13.3 percent).

It is also worth noting that the rates for white households *with* disabilities (26.8 percent of which have computers and 13.3 percent of which have access to the Internet) are roughly equal to those of African American households *without* disabilities (26.3 and 11.4 percent, respectively). Thus, in comparing these populations, disability and race can be seen to be equally significant factors in determining the household's likelihood of exposure to computer technology.

Reasons for Internet Use

By far the most common reasons that people with disabilities cite for using the Internet are sending and receiving electronic mail (1.4 million people, or 67.1 percent of the 2.1 million Internet users) and searching for information (1.3 million, or 62.8 percent; see Table D). These are also the two top-ranked reasons for Internet use among people without disabilities.

Four-tenths (39.0 percent) of Internet users with disabilities read the news online, check the weather forecast, or obtain sports scores. Three-tenths (29.3 percent) take courses over the Internet or use online resources to help with schoolwork. One-quarter (26.2 percent) of Internet users with disabilities use the Internet for job-related tasks, a significantly lower figure than the 43.1 percent of Internet users without disabilities, who are more likely to have jobs. One-sixth (17.0 percent) use the Internet for shopping, paying bills, or other commercial activities, and 15.9 percent use it to look for employment opportunities.

CONCLUSIONS

People with disabilities are perhaps the single segment of society with the most to gain from the new technologies of the electronic age. Yet they have among the lowest rates of use of these technologies. As a result, the potential benefits of computers and the Internet to the disability community are a long way from being realized.

The problem is largely one of access. Many people with disabilities are poor and can little afford a computer capable of navigating the Internet, the specialized software they might need in order to adapt it to their needs, and the monthly charges imposed for access to the Internet. Many people with disabilities, whether elderly or not, lack an awareness of the potential benefits of this technology, an understanding that, for themselves especially, a computer and an Internet connection could become not a toy, but an important tool with which to gain greater independence and social integration.

The advent of lower-cost computing—including the free computers that come with an extended subscription to an Internet service provider—may help to make this technology more available. Simpler user interfaces, which would encourage use by people who are less comfortable with the technology, might also help people with disabilities to overcome any resistance they might have to exploring the Internet. But it seems clear that, in order to clarify the benefits that this technology can offer to the population with disabilities, a concerted program of education will be needed, along with training and support in the use of the hardware and software, before significant progress is made in closing the enormous gaps in technology access that have been identified in this report.

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